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EXAMINER
SCHEIBEL, ROBERT C

ART UNIT	PAPER NUMBER
2666	

DATE MAILED: 01/13/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

-- *The MAILING DATE of this communication appears on the cover sheet with the correspondence address* --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *31 July 2001*.

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-21* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-9 and 11-21* is/are rejected.

7)☒ Claim(s) *10* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

13)☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

    a) ☐ The translation of the foreign language provisional application has been received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .

4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: .

DETAILED ACTION

Specification

1.   The disclosure is objected to because of the following informalities:

- the content in lines 2-8 of page 11 is duplicated in the paragraph in lines 9-15

   of the same page. The redundant information should be removed.

- "is-use" on line 8 of page 28 should be changed to "in-use".

Appropriate correction is required.

Claim Objections

2.   Claim 20 is objected to because of the following informalities: the phrase "is

increments" on line 4 should be changed to something such as "is incremented" or

"increments". Appropriate correction is required.

Claim Rejections - 35 USC § 112

3.   The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly
> claiming the subject matter which the applicant regards as his invention.

4.   Claims 16 and 20 are rejected under 35 U.S.C. 112, second paragraph, as being

indefinite for failing to particularly point out and distinctly claim the subject matter which

applicant regards as the invention.

5.   Claim 16 recites the limitation "the improvement" in line 3. There is insufficient

antecedent basis for this limitation in the claim.

6.   Claim 20 recites the limitation "said buffers" in line 3, and "the buffer" in line 4

and line 5. There is insufficient antecedent basis for this limitation in the claim. It is

unclear which of the buffers (data buffers, state information buffers, or context buffers)

is meant.

Claim Rejections - 35 USC § 103

7.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set
> forth in section 102 of this title, if the differences between the subject matter sought to be patented and
> the prior art are such that the subject matter as a whole would have been obvious at the time the
> invention was made to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was made.

8.   This application currently names joint inventors. In considering patentability of

the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of

the various claims was commonly owned at the time any inventions covered therein

were made absent any evidence to the contrary. Applicant is advised of the obligation

under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was

not commonly owned at the time a later invention was made in order for the examiner to

consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g)

prior art under 35 U.S.C. 103(a).

9.   Claims **1-4, 7, and 11-14** are rejected under 35 U.S.C. 103(a) as being

unpatentable over U.S. Patent 6,373,846 to Daniel et al (hereinafter "Daniel") in view of

U.S. Patent 5,896,511 to Manning et al (hereinafter "Manning").

Regarding claims **1 and 11**, Daniel discloses an integrated circuit for processing events related to communication packets and method of processing events related to communication packets in an integrated circuit **(ATMCSI/TU 32 of figure 2)**, said integrated circuit comprising:

a core processor configured to execute software to process a series of communication packets **(APU 36 of figure 2)**, the processing of each packet being an event **(the events in this case are the processing done by the APU to issue commands to the EDMA; for example, see the description of the EDMA_Move command in column 17, lines 5-10)** and having associated data **(Buffer Data A-C of figure 5)** and context information **(VC Descriptor 118 of figures 5 and 6)**; and

a co-processor **(EDMA unit 40 and CBM 68 of figure 2; see also column 13 line 20-21 "The EDMA unit 40 is effectively a coprocessor under control of the APU")**.

Daniel does not disclose expressly the co-processor comprising a plurality of state information buffers or the limitation of each of said state information buffers having an in-use counter indicating the number of events associated with the contents of said buffer (claims 1 and 11) or the methods of incrementing and decrementing the in-use counter (claim 11).

Manning discloses state information buffers **(the link-level buffer state information 62, 64, 66, 68, and 70 of figure 2; see lines 55-58 of column 8)** each of said state information buffers having an in-use counter **(LINK_BUFFER_COUNTER 62)** indicating the number of events associated with the contents of said buffer. Manning

also discloses incrementing the in-use counter associated with said state information

buffer when an event is associated with said state information buffer **(figure 4 –**

incrementing LINK_BUFFER_COUNTER) and decrementing the in-use counter of

said state information buffer when said event associated with said buffer is finished

(figure 5B – decrementing LINK_BUFFER_COUNTER).

Daniel and Manning are analogous art because they are from the same field of

endeavor of ATM switching devices.

At the time of the invention it would have been obvious to a person of ordinary

skill in the art to modify Daniel by adding the link level state information of Manning.

The motivation for doing so would have been to minimize "the wasting of link bandwidth

to transmit flow control update information" as specified in lines 25-26 of column 2 of

Manning.

Therefore, it would have been obvious to combine Manning with Daniel for the

benefit of minimizing the wasted link bandwidth used for flow control update information

to obtain the invention as specified in claims 1 and 11.

Regarding claims **12**, with the features in the parent claim 11 addressed above,

Daniel, as modified, discloses the plurality of state information buffers **(the link-level**

buffer state information 62, 64, 66, 68, and 70 of figure 2; there are a plurality of

these buffers because there is one for each link in the system).

Regarding claims **2, 4, 7, and 14**, with the features in the parent claims 1 and 11

addressed above, Daniel, as modified, discloses the plurality of context buffers **(VC**

Descriptor 118 of figures 5 and 6), and the plurality of data buffers for storing data

(the CBM contains a plurality of data buffers – Buffer Data A-C of figure 5).

Regarding claims **3 and 13**, with the features in the parent claims 1 and 11

addressed above, Manning discloses the in-use counter for the context buffers

(BUFFER_COUNTER 32') and the incrementing **(Figure 4 – incrementing**

BUFFER_COUNTER) and decrementing **(Figure 5A – decrementing**

BUFFER_COUNTER) of this counter.

Daniel and Manning are analogous art because they are from the same field of

endeavor of ATM switching devices.

At the time of the invention it would have been obvious to a person of ordinary

skill in the art to modify Daniel by adding the per-connection counter

BUFFER_COUNTER, and additionally by adding the link level state information of

Manning as discussed above. The motivation for doing so would have been to add flow

control to Daniel as specified in .

Therefore, it would have been obvious to combine Manning with Daniel for the

benefit of minimizing the wasted link bandwidth used for flow control update information

to obtain the invention as specified in claims 1 and 11.

10.   Claims **5, 6, 8-9, and 15-21** are rejected under 35 U.S.C. 103(a) as being

unpatentable over U.S. Patent 6,373,846 to Daniel et al (hereinafter "Daniel") in view of

U.S. Patent 5,896,511 to Manning et al (hereinafter "Manning") and in further view of

U.S. Patent 6,310,879 to Zhou et al (hereinafter "Zhou").

Regarding claims **16 and 21**, Daniel discloses an integrated circuit **(ATMCSI/TU 32 of figure 2)**, the core processor **(APU 36 of figure 2)**, the co-processor **(EDMA unit 40 and CBM 68 of figure 2; see also column 13 line 20-21 "The EDMA unit 40 is effectively a coprocessor under control of the APU")**, and the data buffers **(Buffer Data A-C of figure 5)**. Regarding claim 21, Daniel further discloses the context buffers **(VC Descriptor 118 of figures 5 and 6)**.

Daniel does not disclose expressly the state information buffers, the in-use counters, or the passing of data between events.

Manning discloses state information buffers **(the link-level buffer state information 62, 64, 66, 68, and 70 of figure 2; see lines 55-58 of column 8)** each of said state information buffers having an in-use counter **(LINK_BUFFER_COUNTER 62)**.

Daniel and Manning are analogous art because they are from the same field of endeavor of ATM switching devices.

At the time of the invention it would have been obvious to a person of ordinary skill in the art to modify Daniel by adding the link level state information of Manning. The motivation for doing so would have been to minimize "the wasting of link bandwidth to transmit flow control update information" as specified in lines 25-26 of column 2 of Manning.

Daniel and Manning, as combined, fail to disclose an in-use counter for the data buffers or the passing of data between events.

Zhou discloses the use of a counter with a data buffer **(the count 24 described in column 6, lines 35-36 "Preferably, the cell 14 includes a count 24 which identifies all ports 18 the cell 14 will be sent out")**. In addition, Zhou discloses passing the data buffer between multiple ports. The data buffer is effectively passed to another port for transmission to another multicast destination each time the count is decremented.

Daniel and Manning and Zhou are analogous art because they are from the same field of endeavor of ATM switching devices.

At the time of the invention it would have been obvious to a person of ordinary skill in the art to apply an in-use count to the data buffers of Daniel, as modified, and to allow the decrementing of this count to effectively indicate the passing of the data buffer to another port.

The suggestion/motivation for doing so would have been to allow Daniel, as modified, to support multicasting while utilizing as little memory as possible. This is suggested by Zhou in column 1, lines 29-32 "Ideally, as little memory as possible should be utilized to maintain the cell for all the different locations to which it will be sent. The present invention provides an efficient approach to providing a cell to a multiplicity of connections for multicast.".

Therefore, it would have been obvious to combine Zhou with Daniel and Manning for the benefit of providing an efficient method of supporting multicast to obtain the invention as specified in claims 16 and 21.

Regarding claims **5, 8, and 9**, with the features of the parent claims 1 and 7 addressed above, Zhou teaches an in-use counter for the data buffers **(the count 24 described in column 6, lines 35-36)**. Manning discloses the in-use counter for the context buffers **(BUFFER_COUNTER 32')**.

Regarding claim **6**, with the features of the parent claim 1 addressed above, Zhou discloses passing the data buffer between multiple ports. The data buffer is effectively passed to another port for transmission to another multicast destination each time the count 24 is decremented.

Regarding claims **15 and 20**, with the features of the parent claims 11 and 16 addressed above, Manning teaches incrementing the in-use counter associated with said state information buffer **(figure 4 – incrementing LINK_BUFFER_COUNTER)** and decrementing the in-use counter of said state information buffer **(figure 5B – decrementing LINK_BUFFER_COUNTER)**. Manning also teaches the incrementing **(Figure 4 – incrementing BUFFER_COUNTER)** and decrementing **(Figure 5A – decrementing BUFFER_COUNTER)** of the in-use counter associated with the context buffer. Zhou teaches incrementing **(column 7, lines 45-47 "Cell C2 has its count 24 incremented to 2 since there are two ports, port 1 and port N which cell C2 will go out.")** and decrementing **(column 6, lines 44-47 "The removing step can include the step of decrementing by one a value of the count 24 equal to the number of ports 18 the cell 14 will be sent out.")** the counter associated with the data buffer.

Regarding claim **17**, with the features of the parent claim 16 addressed above, Daniel, as modified, discloses context information buffers **(VC Descriptor 118 of figures 5 and 6)**.

Regarding claim **18**, with the features of the parent claim 17 addressed above, Manning discloses the in-use counter for the context buffers **(BUFFER_COUNTER 32')**.

Regarding claim **19**, with the features of the parent claim 16 addressed above, Daniel, as modified teaches a plurality of data buffers **(Buffer Data A-C of figure 5)**, and Manning teaches a plurality of state information buffers **(the link-level buffer state information 62, 64, 66, 68, and 70 of figure 2; see lines 55-58 of column 8; one per link)**.

Daniel and Manning and Zhou are analogous art because they are from the same field of endeavor of ATM switching devices.

At the time of the invention it would have been obvious to a person of ordinary skill in the art to apply an in-use count to the data buffers of Daniel, as modified, and to allow the decrementing of this count to effectively indicate the passing of the data buffer to another port.

The suggestion/motivation for doing so would have been to allow Daniel, as modified, to support multicasting while utilizing as little memory as possible. This is suggested by Zhou in column 1, lines 29-32 "Ideally, as little memory as possible should be utilized to maintain the cell for all the different locations to which it will be sent. The present invention provides an efficient approach to providing a cell to a multiplicity of connections for multicast.".

Therefore, it would have been obvious to combine Zhou with Daniel and Manning for the benefit of providing an efficient method of supporting multicast to obtain the invention as specified in claims 5, 6, 8-9, and 15, 17-20.

Allowable Subject Matter

11.   Claim **10** is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

12.   The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. U.S. Patent 6,021,132 to Muller et al also describes a similar device for switching packets with a processor and co-processor.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Robert C. Scheibel whose telephone number is 703-305-9062. The examiner can normally be reached on 6:30-3:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Seema S. Rao can be reached on 703-308-5463. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or

proceeding should be directed to the receptionist whose telephone number is 703-305-

3900.

RCS 12-31-03

Robert C. Scheibel
Examiner
Art Unit 2666

DANG TON
PRIMARY EXAMINER